

We claim:

1. A live recombinant *Mycobacterium bovis*-BCG strain comprising a nucleic acid capable of expression, the nucleic acid encoding at least one protein or polypeptide that exhibits alanine dehydrogenase activity, glutamine synthetase activity, or L-serine dehydratase activity.
2. A live recombinant *Mycobacterium bovis*-BCG strain comprising a nucleic acid capable of expression, the nucleic acid encoding at least one protein or polypeptide selected from the group consisting of alanine dehydrogenase [SEQ ID NO:1; SEQ ID NO:2], glutamine synthetase [SEQ ID NO:7 to SEQ ID NO:14] and L-serine dehydratase [SEQ ID NO:5; SEQ ID NO:6].
3. A live recombinant *Mycobacterium bovis*-BCG strain comprising a nucleic acid capable of expression, the nucleic acid comprises all or part of at least one nucleic acid molecule selected from the group consisting of [SEQ ID NO:1], [SEQ ID NO:5], [SEQ ID NO:7], [SEQ ID NO:9], [SEQ ID NO:11], and [SEQ ID NO:13].
4. A live recombinant *Mycobacterium bovis*-BCG strain comprising a nucleic acid capable of expression, the nucleic acid comprises a sequence having at least 60% sequence identity to at least one nucleic acid molecule selected from the group consisting of [SEQ ID NO:1], [SEQ ID NO:5], [SEQ ID NO:7], [SEQ ID NO:9], [SEQ ID NO:11] and [SEQ ID NO:13].
5. The live recombinant *Mycobacterium bovis*-BCG strain of claim 3 or 4 wherein the nucleic acid molecule has undergone modification.
6. The live recombinant *Mycobacterium bovis*-BCG strain of claim 1, 2, 3, 4, or 5 wherein the *Mycobacterium bovis*-BCG strain is selected from the group consisting of *Mycobacterium bovis*-BCG-Russia, *Mycobacterium bovis*-BCG-Moreau, *Mycobacterium bovis*-BCG-Japan, *Mycobacterium bovis*-BCG-Sweden, *Mycobacterium bovis*-BCG-Birkhaug, *Mycobacterium bovis*-BCG-Prague, *Mycobacterium bovis*-BCG-Glaxo, *Mycobacterium bovis*-BCG-Denmark,

*Mycobacterium bovis*-BCG-Tice, *Mycobacterium bovis*-BCG-Frappier, *Mycobacterium bovis*-BCG-Connaught, *Mycobacterium bovis*-BCG-Phipps, and *Mycobacterium bovis*-BCG-Pasteur.

7. A pharmaceutical composition comprising the live recombinant *Mycobacterium bovis*-BCG strain of claim 1, 2, 3, 4, 5 or 6.
8. A vaccine or immunogenic composition for treatment or prophylaxis of a mammal against challenge by mycobacteria comprising the live recombinant *Mycobacterium bovis*-BCG strain of claim 1, 2, 3, 4, 5 or 6.
9. The vaccine or immunogenic composition of claim 8 wherein the mycobacteria is *Mycobacterium tuberculosis*.
10. The vaccine or immunogenic composition of claim 8 or 9 further comprising a pharmaceutically acceptable carrier.
11. The vaccine or immunogenic composition of claim 8, 9 or 10 further comprising an adjuvant.
12. The vaccine or immunogenic composition of claim 8, 9, 10 or 12 further comprising immunogenic materials from one or more other pathogens.
13. A method for treatment or prophylaxis of a mammal against challenge by *Mycobacterium tuberculosis* or *Mycobacterium bovis* comprising administering to the mammal the live recombinant *Mycobacterium bovis*-BCG strain of claim 1, 2, 3, 4, 5, or 6.
14. The method of claim 13 wherein the mammal is a cow.
15. The method of claim 13 wherein the mammal is a human.
16. The method of claim 13 wherein the vaccine or immunogenic composition is administered in the presence of an adjuvant.

17.A method for treatment or prophylaxis of a mammal against cancer comprising administering to the mammal the live recombinant *Mycobacterium bovis*-BCG strain of claim 1, 2, 3, 4, 5, or 6.

18.The method of claim 17 wherein the vaccine or immunogenic composition is administered in the presence of an adjuvant.

19.The method of claim 17 or 18 wherein the cancer is bladder cancer.

20.A test kit comprising the live recombinant *Mycobacterium bovis*-BCG strain of claim 1, 2, 3, 4, 5, or 6.

21.A media composition for inhibiting the growth of *Mycobacterium bovis*-BCG comprising alanine as the only nitrogen source for growth.

22.A media composition for inhibiting the growth of *Mycobacterium bovis*-BCG comprising serine as the only nitrogen source for growth.

23.The media composition of claim 21 or 22 further comprising:

- (a) a carbon source;
- (b) iron;
- (c) magnesium; and
- (d)  $\text{SO}_4$ .

24.A media composition of claim 23 wherein the carbon source is selected from the group consisting of glycerol, dextrose, citrate and glucose.

25.A method for inhibiting the growth of *Mycobacterium bovis*-BCG comprising:

- (a) obtaining a sample comprising *Mycobacterium*; and
- (b) culturing the sample in a selective media.

26. The method of claim 25, wherein the selective media comprises alanine as the only nitrogen source for growth.

27. The method of claim 25, wherein the selective media comprises serine as the only nitrogen source for growth.

28. A method of culturing *Mycobacterium bovis*-BCG comprising:

(a) obtaining a sample of *Mycobacterium*; and

(b) culturing the sample in differential media.

29. The method of claim 28, wherein the differential media comprises histidine.